



MSAPC ADVISORY CIRCULAR

U.S. ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF AIR AND WATER PROGRAMS • OFFICE OF MOBILE SOURCE AIR POLLUTION CONTROL

A/C NO. 16-2

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SUBJECT: Approval of Emission Control Modifications for High Altitudes
on New Light Duty Motor Vehicles

A. Purpose

The purpose of this Advisory Circular is to provide procedures whereby EPA will approve requests from manufacturers to produce or modify new motor vehicles to reduce emission levels at high altitude. This Advisory Circular supersedes Advisory Circular 16-1 of November 2, 1973, which is obsolete and should be discarded.

B. Background

1. Studies have shown that emission-controlled vehicles emit higher levels of pollutants at high altitudes than those same vehicles emit at low altitudes. For the purposes of this Advisory Circular, "high altitude" means any elevation over 4,000 feet.

2. In many cases, emissions of certified vehicles at higher altitudes can be significantly reduced through the use of modified calibrations in the induction and ignition systems. However, the provisions of Section 203(a)(1) of the Clean Air Act make it a prohibited act for a manufacturer to distribute in commerce, sell, or offer for sale, or introduce, or deliver for introduction, into commerce; or import into the United States any new motor vehicle or motor vehicle engine unless the vehicle or engine is covered by a certificate of conformity. Thus, if a light duty vehicle or light duty truck manufacturer wishes to modify the certified production vehicle, in terms of any of the parameters listed in 40 CFR 85.075-5(a)(3) or 85.075-5(b)(3), or 85.275-5(a)(3) or 85.275-5(b)(3), the manufacturer would need to receive a determination from the Administrator that the vehicle would still be covered by the certificate of conformity then in effect.



3. If the vehicle has already been sold to an ultimate purchaser, Section 203(a)(3) of the Clean Air Act prohibits any manufacturer or dealer from knowingly removing or rendering inoperative any device or element of design on or in a vehicle in compliance with regulations under Section 202 of the Act. Thus, manufacturers and dealers who modify the emission control system to reduce emission levels at high altitudes may first obtain a determination from the Administrator of EPA that such modification would not "render inoperative" the emission control system to avoid running the risk of violating Section 203(a)(3), as provided for in Advisory Circular 2A.

4. EPA encourages manufacturers to provide the vehicle owner the capability to have his vehicle modified so as to lower emission levels at high altitudes. EPA also encourages manufacturers to test vehicles intended for sale at high altitude so as to demonstrate conformance with emission control standards at high altitude. Advisory Circular 16-1 required that a demonstration of compliance with emission standards at high altitude include mileage accumulation at high altitude. This revision of A/C 16-1 removes this latter requirement.

5. EPA has proposed in the Federal Register regulations which would require manufacturers to demonstrate compliance with emission standards prior to being allowed to sell new vehicles in high altitude locations in which they would be initially registered. The comments on this NPRM are still being considered, and no final regulation has as yet been issued. Nevertheless, to meet the air pollution control needs of communities located at high altitude, a number of manufacturers have expressed the wish to sell specially designed vehicles in such locations. The procedures in this Advisory Circular are provided to facilitate meeting these needs in the interim, until the new regulations become effective.

6. There are two basic approaches that can at this time be followed to acquire coverage by a certificate of conformity of vehicles intended for initial sale at high altitude:

(a) Manufacturers can demonstrate that their vehicles comply with emission standards at high altitude. The procedures set forth in this Advisory Circular are intended only to provide for this approach.

(b) Manufacturers can demonstrate that their vehicles meet emission standards at Ann Arbor as currently practiced.



7. EPA has not yet had sufficient experience with the testing of high altitude modifications to heavy duty engines to extend the provisions of this circular to include heavy duty engines. Therefore, the provisions of Advisory Circular No. 16 remain applicable to heavy duty engines. EPA will accept data concerning the testing of high altitude modifications to heavy duty engines to determine future applicability of the provisions of this circular to heavy duty engines.

C. Applicability

The procedures described in this Advisory Circular are effective immediately and apply to applications received after the date of this Advisory Circular for modification of prior, current, and future model year light duty vehicles and light duty trucks for conformance to emission standards at high altitude. It is reemphasized that the procedures and requirements set forth in this Advisory Circular relate only to an option that is available to a manufacturer if he elects to utilize it and does not impose a requirement on manufacturers to demonstrate compliance of vehicles at high altitude as a precondition to being allowed to sell vehicles at high altitude locations.

D. Compliance of Vehicles Described in the Application for Certification Which are Intended for Sale at High Altitude

1. Vehicles with high altitude modifications shall be so described in the application for certification, in accordance with 40 CFR 85.075-2, 85.175-2, and 85.275-2.

2. Vehicles so described will be eligible for selection as emission data vehicles in accordance with 40 CFR 85.075-5(b)(3), 85.175-5(b)(3), and 85.275-5(b)(3).

3. Vehicles which are intended for initial sale at high altitude which are selected as emission data vehicles will be tested under high altitude conditions after 4,000 miles of operation. The high altitude emission test of the vehicle shall be made with the vehicle configured and calibrated as it will be built for initial sale at high altitude.

4. EPA reserves the right to confirm the test results submitted by the manufacturer by testing the emission data vehicle under high altitude conditions.



5. If mileage accumulation is conducted at an altitude of less than 4,000 feet, the vehicle shall be operated for mileage accumulation equipped with the low altitude modifications required under Section D.8, of this Advisory Circular. Fuels with higher octane rating than that specified in 40 CFR 85.075-10(b), 85.175-10(c) and 85.275-10(b) may be used if recommended by the manufacturer in the maintenance instructions for low altitude operations, if approved in advance by EPA.

6. The certificate of conformity granted to the manufacturer for the engine family will state which vehicles in the engine family have demonstrated compliance with emission standards at high altitude only.

7. The label, required under 40 CFR 85.075-35, 85.175-35, and 85.275-35, which if affixed to vehicles with high altitude modifications shall state "This Vehicle is Modified for High Altitude Operation" and shall include the engine tuneup specifications and adjustments recommended by the manufacturer for vehicles operated at high altitude.

8. The maintenance instructions provided with vehicles built and calibrated for high altitude shall generally explain the adjustments or modifications, if any, that are necessary to the emission control system to allow the vehicle to meet emission standards at low altitude. If such modifications include component replacement, the instructions shall identify the components required to be replaced to return the vehicle to a certified, low altitude configuration. The maintenance instructions shall include a statement, if applicable, that the vehicle's emission control system is not designed for conversion to provide for proper functioning at low altitude.

E. Vehicles Proposed to be Added to the Engine Family in Anticipation of Certification

1. Manufacturers may request, separately from submission of the Part I Application, certification of vehicles with high altitude modifications, before receipt of certification of the full engine family. Such request would be made in accordance with 40 CFR 85.075-32, 85.175-32, and 85.275-32. Testing of such vehicles will be in accordance with the provisions of 40 CFR 85.075-32(b), 85.175-32(b), and 85.275-32(b), and as further described in D. above.

2. EPA reserves the right to confirm the test results submitted by the manufacturer by testing vehicle(s) selected in accordance with Section E.1. above under high altitude conditions.

3. If EPA determines that such vehicles meet all applicable standards the appropriate certificate of conformity will be amended accordingly. Such certificate will state that such vehicles have demonstrated compliance with emission standards only at high altitude.



4. The label requirements are the same as described in D.7. of this Advisory Circular.

5. The maintenance instructions will provide the same information as described in D.8. of this Advisory Circular.

F. High Altitude Running Changes

1. A manufacturer may add to his product line a vehicle designed for high altitude operation but which was not described in the application for certification at the time the certificate was issued. If the vehicles to be added are not of the same engine-system combination as vehicles previously certified, an application for separate certification as described in 40 CFR 85.075-31, 85.175-31, or 85.275-31 must be submitted. If the modifications for high-altitude operation involve the same engine-system combination as vehicles previously certified, the requests should be submitted in accordance with 40 CFR 85.075-33, 85.175-33, and 85.275-33, "Changes to a Vehicle Covered by Certification".

2. If the modification is an alternate calibration (the usual case), any required testing will be done on a vehicle which has accumulated at least 4,000 miles. The mileage on the test vehicle need not have been accumulated under high altitude conditions, and the modifications for high altitude operation may be made after mileage accumulation.

3. The label requirements are the same as described in D.7. of this Advisory Circular.

4. The maintenance instructions will provide the same information as described in D.8. of this Advisory Circular.

Eric O. Stork
Deputy Assistant Administrator
for Mobile Source Air Pollution Control